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REMARKS/ARGUMENTS

Status of the Claims

Claims 1-3, 6, 7, 10, 13, 14, 22, and 24 have been amended to clarify that Applicants' claimed invention is drawn to isolated DNA molecules. This amendment to the claims is responsive to an objection set forth in the Office Action that is discussed in detail below. In the Office Action, the Examiner recommended replacing "DNA sequence" with "--DNA molecule--". Applicants have amended claims 1-3, 6, 7, 13, 14, and 22 as recommended. This amendment to the claims is purely formal in nature and is fully supported by the original claims and specification, particularly page 19.

Claims 10 and 24 have also been amended in response to the above-mentioned objection. Claim 10 has been amended to clarify that the plant expression vector comprises "a promoter expressible in a plant cell operably linked to the DNA molecule comprising the sequence set forth in SEQ ID NO:1." Claim 24 has been amended to clarify that the plant expression vector recited therein comprises "a promoter . . . operably linked to a DNA molecule encoding an *Arabidopsis* AHAS small subunit protein, wherein said DNA molecule comprises a sequence selected from the group consisting of the DNA sequence set forth in SEQ ID NO: 1 and the DNA sequence set forth in SEQ ID NO: 3." The amendments to claims 10 and 24 are purely formal in nature and are fully supported by the original claims and specification, particularly page 19.

In addition to the amendments made in response to the above-mentioned objections, Applicants have further amended claims 13 and 22 to point out more distinctly that the isolated DNA molecules recited therein encode *Arabidopsis thaliana* AHAS small subunit proteins. Support for this amendment to the claims can be found in the specification, particularly on page 15.

New claims 26-29 have been added. The new claims are directed to transgenic seeds of the transgenic plants of claims 4, 8, 22, and 24, respectively. Support for the new claims can be found in the specification, particularly on page 14.

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No new matter has been added by way of amendment of the claims or by the addition of the new claims.

Claims 1-14 and 22-29 are pending.

Reexamination and reconsideration of the application as amended are respectfully requested.

The Objections to the Claims Should Be Withdrawn

Claims 1-14 and 22-25 have been objected to for use of informalities. The Office Action indicates that the phrase "DNA sequence" in claims 1-3, 6, 7, 10, 13, 14, 22, and 24 should be amended to read --DNA molecule-- to denote a composition of matter and not information. Applicants respectfully disagree with the objection because one of ordinary skill in the art would readily understand what Applicants intend by use of the phrase "DNA sequence". In the interest of furthering prosecution, however, Applicants have amended claims 1-3, 6, 7, 13, 14, and 22 to make the recommended replacement. These amendments to the claims are purely formal in nature and do not further limit the scope of the claims. Accordingly, the objections to claims 1-3, 6, 7, 13, 14, and 22 and their respective dependent claims have been overcome.

Claims 10 and 24 have also been amended but not exactly as recommended in the Office Action. The amendments to these claims do, however, clarify that these claims involve a composition of matter, particularly a DNA molecule. Claim 10 has been amended to insert --molecule comprising the-- between "DNA" and "sequence". As amended claim 10 recites "the DNA molecule comprising the sequence set forth in SEQ ID NO: 1." In claim 24, the first instance of "DNA sequence" has been replaced with --DNA molecule--. However, this replacement was not made for the second, third, and fourth instances of "DNA sequence" in claim 24. Instead, the relevant portion of claim 24 has been amended to recite "wherein said DNA molecule comprises a sequence selected from the group consisting of the DNA sequence set forth in SEQ ID NO: 1 and the DNA sequence set forth in SEQ ID NO: 3." These amendments to claims 10 and 24 are purely formal in nature and do not further limit the scope of

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the claims. Accordingly, the objections to claims 10 and 24 and dependent claims 11-12 have been overcome.

In view of the amendments to the claims and the remarks, it is submitted that the objections to claims 1-14 and 22-25 should be withdrawn and not applied to the newly submitted claims.

The Rejections of the Claims Under 35 U.S.C. § 112, First Paragraph, Should Be Withdrawn

Claims 13, 14, 22, and 23 have been rejected under 35 U.S.C. § 112, first paragraph. Claims 13, 14, and 22 have been amended. New claims 26-29 have been added. This rejection is respectfully traversed and should not be applied to the newly submitted claims.

Written Description

Claims 13, 14, 22, and 23 have been rejected under 35 U.S.C. § 112, first paragraph, for failure to comply with the written description requirement. The Office Action indicates Applicants describe an isolated DNA molecule encoding an *Arabidopsis thaliana* AHAS small subunit protein but do not describe isolated DNA molecules encoding AHAS small subunit proteins from other species of *Arabidopsis*. The Office Action asserts that from the instant specification it is unclear that the Applicants were in possession of the invention as broadly claimed.

In contrast to this position of the Office Action, the specification provides adequate description of the subject matter of 13, 14, 22, and 23, so as to reasonably convey to one skilled in the relevant art that Applicants had possession of the invention as claimed. In particular, the specification discloses on page 6 that the invention encompasses "DNA sequences encoding a biologically functional eukaryotic AHAS small subunit protein and functional variants thereof." Furthermore, the specification indicates on page 41 that homologous AHAS small subunit gene sequences can be obtained from a variety of plant species using stringent DNA hybridization

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techniques. Certainly, those of ordinary skill in the art would consider "a variety of plant species" to include species of *Arabidopsis*, other than *Arabidopsis thaliana*. The specification further discloses on page 33 specific hybridization conditions that can be used to isolate such homologous sequences. Accordingly, the subject matter of claims 13, 14, 22, and 23 is adequately described in the instant specification so as to reasonably convey to one of ordinary skill in the relevant art that, at the time of the invention, Applicants had possession of their claimed invention.

In the interest of furthering prosecution, Applicants have amended claims 13 and 22 to point out more distinctly that these claims are directed to an isolated DNA molecule encoding an *Arabidopsis thaliana* AHAS small subunit protein. Accordingly, the written description requirement is satisfied for Applicants' claimed invention.

This amendment to claims 13 and 22, however, does not further limit the scope of claim 1 and its dependent claims to isolated DNA molecules encoding a small subunit of an *Arabidopsis thaliana* AHAS protein. Claim 1 is directed to an isolated DNA molecule encoding a functional eukaryotic AHAS small subunit protein, wherein said DNA molecule hybridizes to the complement of SEQ ID NO:1 under the specific conditions recited therein. Given the very close genetic relationship among the various species of the genus *Arabidopsis*, the nucleotide sequences of the individual AHAS small subunit genes are expected to be highly similar to one another and to SEQ ID NO: 1, and thus, would likely hybridize to SEQ ID NO: 1 under the hybridization conditions recited in claim 1.

Enablement

Claims 13, 14, 22, and 23 have been rejected under 35 U.S.C. § 112, first paragraph, for lack of enablement. The Office Action indicates that Applicants teach an isolated DNA molecule having the nucleic acid sequence of SEQ ID NO:1 or encoding the amino acid sequence of SEQ ID NO:2 but do not teach isolated DNA molecules encoding AHAS small subunit proteins from other species of *Arabidopsis*. The Office Action further indicates that

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Applicants teach how to make and use a DNA molecule encoding an AHAS small subunit protein isolated from *Arabidopsis thaliana*. The Office Action asserts that Applicants do not teach how to make and use DNA molecules encoding AHAS small subunit proteins from other species of *Arabidopsis*. The Office Action further asserts that the Duggleby *et al.* reference teaches that the function of any DNA sequence, whose identity is based solely on homology, can only be proven in experiments designed to evaluate that the function. The Office Action concludes that it would have required undue trial and error experimentation by one of ordinary skill in the art at the time of Applicants' invention to make a transgenic plant comprising an isolated DNA molecule encoding an AHAS small subunit protein from all *Arabidopsis* species as broadly claimed.

Applicants respectfully disagree with this conclusion of the Office Action. The specification provides sufficient guidance to make and use not only isolated DNA sequences encoding an *Arabidopsis thaliana* AHAS small subunit protein but also isolated DNA sequences encoding AHAS small subunit proteins from other *Arabidopsis* species. In particular, Applicants have provided the DNA sequence of SEQ ID NO: 1 and guidance on DNA hybridization methods. Thus, the specification provides sufficient guidance for one of ordinary skill in the art to isolate and use other homologous DNA molecules from other plant species, including other *Arabidopsis* species. In fact, the specification provides:

Based on the techniques of the present invention and following stringent DNA hybridization techniques, homologous AHAS small subunit gene sequences can be obtained from a variety of plant species, such as rice, maize, wheat, barley, and the like. Therefore, these AHAS small subunit gene sequences are also useful in the present vectors and methods for transforming plants.

Specification, p. 41 (as amended in the Amendment dated June 19, 2003). Accordingly, the specification is enabled for transgenic plants comprising an isolated DNA molecule encoding an *Arabidopsis* AHAS small subunit protein.

In the interest of furthering prosecution, Applicants have amended claims 13 and 22 to point out more distinctly that these claims are directed to an isolated DNA molecule encoding an AHAS small subunit protein isolated from *Arabidopsis thaliana*. Accordingly, the specification

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provides sufficient guidance to allow one skilled in the art to make and use Applicants' claimed invention.

For the reasons discussed above, this amendment to claims 13 and 22 does not further limit the scope of claim 1 and its dependent claims to isolated DNA molecules encoding a small subunit of an *Arabidopsis thaliana* AHAS protein.

In view of the amendments and remarks, it is submitted that the rejections under 35 U.S.C. § 112, first paragraph, for written description and enablement should be withdrawn and not applied to the newly submitted claims.

The Rejection of the Claims for Double Patenting Should Be Withdrawn

Claims 1-14 and 22-25 have been rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 2, 4, and 23 of U.S. Patent No. 6,348,643. Claims 1-3, 6, 7, 10, 13, and 14 have been amended. New claims 26-29 have been added. This rejection is respectfully traversed and should not be applied to the newly submitted claims.

The Office Action indicates that rejection of claims 1-14 for obviousness-type double patenting has been maintained for the reasons of record put forth in the previous Office Action. The Office Action confirms that Applicants submitted a terminal disclaimer to the Office on February 3, 2004. The Office Action, however, indicates that the terminal disclaimer had not been approved as of the mailing date of the Office Action. Accordingly, Applicants respectfully request that the Examiner consider and approve the terminal disclaimer that is of record.

In view of the previously submitted terminal disclaimer and the above remarks, it is submitted that the rejections of claims 1-14 and 22-25 under the judicially created doctrine of obviousness-type double patenting should be withdrawn and not applied to the newly submitted claims.

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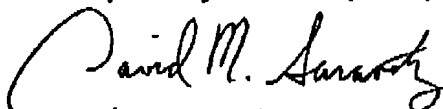
CONCLUSIONS

In view of the above amendments and remarks and the previously submitted terminal disclaimer, Applicants submit that the objections to the claims and the rejections of the claims under 35 U.S.C. § 112 and the judicially created doctrine of obviousness-type double patenting are overcome. Applicants respectfully submit that this application is now in condition for allowance. Early notice to this effect is solicited.

If in the opinion of the Examiner a telephone conference would expedite the prosecution of the subject application, the Examiner is invited to call the undersigned.

It is not believed that extensions of time or fees for net addition of claims are required, beyond those that may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 CFR § 1.136(a), and any fee required therefore (including fees for net addition of claims) is hereby authorized to be charged to Deposit Account No. 16-0605.

Respectfully submitted,

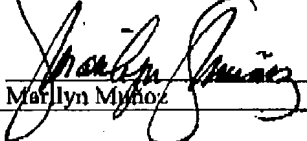


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CERTIFICATION OF FACSIMILE TRANSMISSION

I hereby certify that this paper is being facsimile transmitted to Examiner David H. Kruse at the US Patent and Trademark Office at facsimile number (703) 872-9306 on the date shown below.


Marilyn Myhres

May 7, 2004
Date